

**Remarks**

This Application has been carefully reviewed in light of the Office Action mailed January 14, 2003. Applicants appreciate the Examiner's consideration of the Application. Although Applicants believe all pending claims are allowable over the prior art of record without amendment, to expedite issuance of the Application Applicants have made clarifying amendments to Claims 1-5, have canceled Claim 6, and have added new Claims 7-48. None of these changes are considered necessary for patentability. Applicants respectfully request reconsideration and allowance of all pending claims.

**The Claims are Allowable over *Linden***

The Examiner rejects Claims 1-6 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,266,649 to Linden et al. ("*Linden*"). Applicants respectfully disagree.

*Linden* fails to disclose numerous limitations specifically recited in Applicants' independent claims, whether *Linden* is considered alone, in combination with any other reference of record, or in combination with knowledge generally available to those skilled in the art at the time of the invention. For example, at a minimum, *Linden* fails to disclose, teach, or suggest the following limitations specifically recited in independent Claim 1 (and substantially similar limitations specifically recited in independent Claims 5, 33, and 48):

- the user request specifying a desired attribute value for each of one or more selected product attributes
- a search procedure operable to select a set of one or more candidate alternative products having attribute values consistent with the desired attribute values for the selected product attributes
- for each potential alternative product in a set of potential alternative products the search procedure operable to:
  - for each selected product attribute, compare the desired attribute value with the attribute value for the potential alternative product to determine a attribute similarity value for the product attribute for the potential alternative product; and
  - determine a product similarity value for the potential alternative product according to the attribute similarity values;
  - the set of one or more candidate alternative products being selected according to the product similarity values for the potential alternative products

- a sort procedure operable to rank the one or more candidate alternative products in order of decreasing similarity to the requested product determined according to the product similarity values for the one or more candidate alternative products

In contrast, *Linden* merely discloses a recommendations service that recommends items to a user based on a previously performed mapping of a first set of items already known to be of interest to the user to a second set of items previously determined to be similar to the first set of items based on purchase history data. Not only does *Linden* fail to disclose, teach, or suggest determining similarities between items based on a comparison of attribute values for individual product attributes as specifically recited in Applicants' independent claims, *Linden* explicitly states that the disclosed service not relying on such attribute value comparisons provides an important advantage. In particular, *Linden* states that an important benefit of the disclosed service "is that the items need not contain any content that is amenable to feature extraction techniques . . . . For example, the method can be used to generate a similar items table given nothing more than the product IDs of a set of products and user purchase histories with respect to these products." (Column 13, Line 63 – Column 14, Line 3)

As additional examples distinguishing *Linden* from the limitations specifically recited in Applicants' independent claims, *Linden* states the following:

- A recommendations service recommends items to individual users based on a set of items that are known to be of interest to the user . . . . The service generates the recommendations using a previously-generated table which maps items to lists of "similar" items. . . . [T]he similarities are based on correlations between the purchases of items by users (e.g., items A and B are similar because a relatively large portion of the users that purchased item A also bought item B). The table also includes scores which indicate degrees of similarity between individual items. To generate personal recommendations, the service retrieves from the table the similar items lists corresponding to the items known to be of interest to the user. These similar items lists are appropriately combined into a single list, which is then sorted (based on combined similarity scores) and filtered to generate a list of recommended items. (Abstract)
- Another important benefit is that the recommended items are identified using a previously-generated table or other mapping structure which maps individual

items to lists of "similar" items. The item similarities reflected by the table are based at least upon correlations between the interests of users in particular items. (Column 2, Lines 39-45)

- [T]he mappings of items to similar items ("item-to-item mappings") are generated periodically, such as once per week, by an off-line process which identifies correlations between known interests of users in particular items. For example, in the embodiment described in detail below, the mappings are generating by periodically analyzing user purchase histories to identify correlations between purchases of items. The similarity between two items is preferably measured by determining the number of users that have an interest in both items relative to the number of users that have an interest in either item (e.g., items A and B are highly similar because a relatively large portion of the users that bought one of the items also bought the other item). (Column 2, Line 57 – Column 3, Line 3)
- To generate a set of recommendations for a given user, the service retrieves from the table the similar items lists corresponding to items already known to be of interest to the user, and then appropriately combines these lists to generate a list of recommended items. For example, if there are three items that are known to be of interest to the user (such as three items the user recently purchased), the service may retrieve the similar items lists for these three items from the table and combine these lists. (Column 3, Lines 7-15)
- An important aspect of the service is that the relatively computation-intensive task of correlating item interests is performed off-line, and the results of this task (item-to-item mappings) stored in a mapping structure for subsequent look-up. This enables the personal recommendations to be generated rapidly and efficiently (such as in real-time in response to a request by the user), without sacrificing breadth of analysis. (Column 3, Lines 30-37)
- Two specific implementations of the service are disclosed, both of which generate personal recommendations using the same type of table. In the first implementation, the recommendations are based on the items that have recently been rated or purchased by the user. In the second implementation, the recommendations are based on the current shopping cart contents of the user. (Column 4, Lines 1-7)
- Briefly, given a unary listing of items that are "known" to be of interest to a user (e.g., a list of items purchased, rated, and/or viewed by the user), the Recommendation Service generates a list of additional items ("recommendations") that are predicted to be of interest to the user. . . . The recommendations are generated using a table which maps items to lists of "similar" items ("similar items lists"), without the need for users to rate any items (although ratings data may optionally be used). For example, if there are three items that are known to be of interest to a particular user (such as three items the user recently purchased), the service may retrieve the similar items lists for these three items from the table, and appropriately combine

these lists (as described below) to generate the recommendations. . . . [T]he mappings of items to similar items ("item-to-item mappings") are generated periodically, such as once per week, from data which reflects the collective interests of the community of users. More specifically, the item-to-item mappings are generated by an off-line process which identifies correlations between known interests of users in particular items. For example, in the embodiment described in detail below, the mappings are generating by analyzing user purchase histories to identify correlations between purchases of particular items (e.g., items A and B are similar because a relatively large portion of the users that purchased item A also bought item B). (Column 5, Line 37 – Column 6, Line 2)

- An important aspect of the Recommendation Service is that the relatively computation-intensive task of correlating item interests is performed off-line, and the results of this task (item-to-item mappings) are stored in a mapping structure for subsequent look-up. This enables the personal recommendations to be generated rapidly and efficiently (such as in real-time in response to a request by the user), without sacrificing breadth of analysis. (Column 6, Lines 5-13)
- As depicted by the arrows in FIG. 1, the recommendation process 52 generates personal recommendations based on information stored within the similar items table 60, and based on the items that are known to be of interest ("items of known interest") to the particular user. (Column 8, Lines 29-34)
- The similar items table 60 is preferably generated periodically (e.g., once per week) by the off-line table generation process 66. The table generation process 66 generates the table 60 from data that reflects the collective interests of the community of users. In the embodiment described in detail herein, the similar items table is generated exclusively from the purchase histories of the community of users (as depicted in FIG. 1). (Column 8, Line 66 – Column 9, Line 6)
- Each entry in the similar items table 60 is preferably in the form of a mapping of a popular item 62 to a corresponding list 64 of similar items ("similar items lists"). . . . Each similar items list 64 consists of the N (e.g., 20) items which, based on correlations between purchases of items, are deemed to be the most closely related to the respective popular item 62. Each item in the similar items list 64 is stored together with a commonality index ("CI") value which indicates the relatedness of that item to the popular item 62, based on sales of the respective items. A relatively high commonality index for a pair of items ITEM A and ITEM B indicates that a relatively large percentage of users who bought ITEM A also bought ITEM B (and vice versa). . . . [T]he similar items lists are generated, for each popular item, by selecting the N other items that have the highest commonality index values. (Column 9, Lines 16-49)
- As illustrated by FIG. 2, the first step (step 80) of the recommendations-generation process involves identifying a set of items that are of known

interest to the user. . . . [T]he items of known interest are selected from one or more of the following groups: (a) items in the user's purchase history (optionally limited to those items purchased from a particular shopping cart); (b) items in the user's shopping cart (or a particular shopping cart designated by the user), (c) items rated by the user (optionally with a score that exceeds a certain threshold, such as two), and (d) items in the "recent shopping cart contents" listed associated with a given user or shopping cart. In other embodiments, the items of known interest may additionally or alternatively be selected based on the viewing activities of the user. For example, the recommendations process 52 could select items that were viewed by the user for an extended period of time and/or viewed more than once. . . . For each item of known interest, the service retrieves the corresponding similar items list 64 from the similar items table 60 (step 82), if such a list exists. If no entries exist in the table 60 for any of the items of known interest, the process 52 may be terminated . . . . (Column 10, Line 37 – Column 11, Line 1)

- o The table-generation process 66 is preferably executed periodically (e.g., once a week) to generate a similar items table 60 that reflects the most recent purchase history data. . . . FIG. 3 illustrates the sequence of steps that are performed by the table generation process 66 to build similar items table 60. . . . As depicted by FIG. 3, the process initially retrieves the purchase histories for all customers (step 100). . . . In steps 102 and 104, the process generates two temporary tables 102A and 104A. The first table 102A maps individual customers to the items they purchased. The second table 104A maps items to the customers that purchased such items. . . . In step 106, the process identifies the items that constitute "popular" items. . . . In step 108, the process counts, for each (popular\_item, other\_item) pair, the number of customers that are in common. . . . In step 110, the process generates the commonality indexes for each (popular\_item, other\_item) pair in the table 108A. As indicated above, the commonality index (CI) values are measures of the similarity between two items with larger CI values indicating greater degrees of similarity. . . . Following step 110 of FIG. 3, each popular item has a respective "other\_items" list which includes all of the other\_items from the table 108A and their associated CI values. In step 112, each other\_items list is sorted from highest-to-lowest commonality index. (Column 11, Line 58 – Column 13, Line 43)
- o An important benefit of the FIG. 3 method, however, is that the items need not contain any content that is amenable to feature extraction techniques, and need not be pre-assigned to any categories. For example, the method can be used to generate a similar items table given nothing more than the product IDs of a set of products and user purchase histories with respect to these products. (Column 13, Line 63 – Column 14, Line 3)
- o Another important benefit of the Recommendation Service is that the bulk of the processing (the generation of the similar items table 60) is performed by an off-line process. (Column 14, Lines 4-6)

- The Instant Recommendations service generates the recommendations based exclusively on the purchase history and any item ratings profile of the particular user. (Column 14, Lines 24-26)

Additionally, Applicants' dependent claims are allowable based on their dependence on the independent claims and further because they recite numerous additional patentable distinctions over the prior art. Because Applicants believe they have amply demonstrated that the allowability of the independent claims over the prior art, and to avoid unnecessarily burdening the record, Applicants have not provided detailed remarks concerning the dependent claims. However, Applicants remain ready to provide such remarks if it becomes appropriate to do so.

For at least the above reasons, Applicants respectfully request reconsideration and allowance of independent Claims 1, 5, 33, and 48 and all claims that depend therefrom.

**Conclusion**

Applicants have made an earnest attempt to place this case in condition for allowance. For at least the foregoing reasons, Applicants respectfully request full allowance of all the pending claims.

If the Examiner believes a telephone conference would advance prosecution of this case in any way, the Examiner is invited to contact Christopher W. Kennerly, the Attorney for Applicants, at the Examiner's convenience at (214) 953-6812.

A check for \$570.00 is attached to cover the cost of one additional independent claim over three and twenty-seven additional claims over twenty. Although Applicants believe no other fees are due, the Commissioner is hereby authorized to charge any additional fees or credit any overpayments to Deposit Account No. 02-0384 of Baker Botts L.L.P.

Respectfully submitted,

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**Appendix A****Mark-Ups Reflecting Changes to the Specification**

Please replace the first paragraph on Page 12 (through the first colon on Page 12) with:

The system will compare the attribute value for the substitute,  $A_Q$  with that for the original product,  $A_O$ . If  $[A_O] \underline{A_Q}$  is less than  $A_O$ , the Attribute Similarity Index for Product  $P_Q$  and attribute  $X_A$ ,  $SI_{OQ}(X_A)$  is calculated as follows:



**Appendix B**  
**Mark-Ups Reflecting Changes to the Claims**

1. (Amended) A system for offering to a user [alternate] one or more alternative products similar to a requested product, comprising:

a first user interface operable to receive a user request for a product[, such product] having one or more product attributes, the user request specifying a desired attribute value for each of one or more selected product attributes;

a search procedure operable to select a set of one or more candidate [alternate] alternative products having [attributes similar to the requested] attribute values consistent with the desired attribute values for the selected product attributes, for each potential alternative product in a set of potential alternative products the search procedure operable to:

for each selected product attribute, compare the desired attribute value with the attribute value for the potential alternative product to determine a attribute similarity value for the product attribute for the potential alternative product; and

determine a product similarity value for the potential alternative product according to the attribute similarity values;

the set of one or more candidate alternative products being selected according to the product similarity values for the potential alternative products;

a sort procedure operable to rank the one or more candidate [alternate] alternative products in order of decreasing similarity to the requested product determined according to the product similarity values for the one or more candidate alternative products; and

a second user interface operable to present the set of one or more candidate alternative products to the user for selection of a candidate alternative product.

2. (Amended) The system of Claim 1, wherein the first and second user interfaces are combined to function as a single user interface.

3. (Amended) The system of Claim 1, further comprising[:] a database [connected] coupled to the search procedure, the database containing information identifying

available products, the availability of such products, and the product attributes of such products, the search procedure operable to access the information in the database and, based on the accessed information, to exclude from the set of one or more candidate alternative products all potential alternative products for which no excess supply is available.

4. (Amended) The system of Claim 3, wherein the second user interface, when the user selects [an] a candidate alternative [alternate] product, is operable to cause[s] the information [regarding] in the database identifying the availability of the selected candidate alternative [alternate] product to be updated.

5. (Amended) A method for offering[, to a user[, alternate] one or more alternative products similar to a requested product, comprising[ the steps of]:

receiving from the user a request for a preferred product having one or more product attributes, the user request specifying a desired attribute value for each of one or more selected product attributes;

selecting a set of one or more candidate alternative products having attributes [similar to the preferred product] consistent with the desired attribute values for the selected product attributes, for each potential alternative product in a set of potential alternative products the search procedure operable to:

for each selected product attribute, compare the desired attribute value with the attribute value for the potential alternative product to determine an attribute similarity value for the product attribute for the potential alternative product; and

determine a product similarity value for the potential alternative product according to the attribute similarity values;

the set of one or more candidate alternative products being selected according to the product similarity values for the potential alternative products;

rank ordering the one or more candidate alternative products according to their degree of similarity with the preferred product determined according to the product similarity values for the one or more candidate alternative products; and

presenting to the user the [list of] set of one or more candidate alternative products for selection of a candidate alternative product.

**Please cancel Claim 6 without prejudice or disclaimer.**

7. (New) The system of Claim 1, wherein the desired attribute value for a selected product attribute comprises a maximum, minimum, or exact attribute value for the selected product attribute.

8. (New) The system of Claim 1, wherein:  
the user request further specifies one or more of a maximum attribute value and a minimum attribute value for each selected product attribute; and  
the search procedure is operable to exclude from the set of one or more candidate alternative products all potential alternative products having attribute values that do not satisfy one or more of the maximum attribute value and the minimum attribute value for a corresponding selected product attribute.

9. (New) The system of Claim 1, wherein the user request further specifies a desired level of similarity for each of one or more product characteristics, each product characteristic encompassing one or more selected product attributes.

10. (New) The system of Claim 9, wherein the specified desired level of similarity for a product characteristic acts as a constraint on the attribute values a potential alternate product may have to become a candidate alternative product.

11. (New) The system of Claim 1, wherein the search procedure is operable to determine maximum and minimum attribute values across all potential alternative products for each product attribute for which a desired attribute value is specified.

12. (New) The system of Claim 1, wherein each attribute similarity value  $ASV$  for a selected product attribute is calculated as follows:

if the attribute value  $x$  for the potential alternative product is less than the desired attribute value  $A_r$  for the requested product,

$$ASV = \frac{x^2 - A_{min}^2}{A_r^2 - A_{min}^2}$$

where  $A_{min}$  is a minimum attribute value for the selected product attribute across all potential alternative products; and

if the attribute value  $x$  for the potential alternative product is greater than the desired attribute value  $A_r$  for the requested product,

$$ASV = \frac{x^2 - A_{max}^2}{A_r^2 - A_{max}^2}$$

where  $A_{max}$  is a maximum attribute value for the selected product attribute across all potential alternative products.

13. (New) The system of Claim 1, wherein if a selected product attribute is a binary attribute, then the attribute similarity value for a potential alternative product is zero if the attribute value for the potential alternative product is not the same as the desired attribute value for the requested product and is one if the attribute value for the potential alternative product is the same as the desired attribute value for the requested product.

14. (New) The system of Claim 1, wherein:  
the user request further specifies an attribute weight for each selected product attribute; and

the search procedure is operable to:

determine a weighted sum of the attribute similarity values for the selected product attributes for the potential alternative product according to the attribute weights for the selected product attributes; and

determine the product similarity value for the potential alternative product according to the weighted sum of the attribute similarity values.

15. (New) The system of Claim 1, wherein the product similarity value for a potential alternative product comprises a global index value for the potential alternative product with respect to the requested product.

16. (New) The system of Claim 1, wherein:  
the user request further specifies a threshold product similarity value; and  
the search procedure is operable to compare the product similarity value for each potential alternative product with the threshold product similarity value and to exclude from the set of one or more candidate alternative products each potential alternative product having a product similarity value that does not satisfy the threshold product similarity value.

17. (New) The system of Claim 1, wherein the sort procedure is operable to limit the ranked candidate alternative products to a user-specified number.

18. (New) The system of Claim 1, wherein:  
the user request further specifies an attribute weight for each selected product attribute; and

the sort procedure is operable to:

if two candidate alternative products are tied in that they have the same product similarity values, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the highest attribute weight;

if the two candidate alternative products are still tied in that they have the same attribute similarity value for the selected product attribute having the highest attribute weight, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the second highest attribute weight;  
and

if necessary to break the tie, continuing with respect to one or more successive selected product attributes having lower attribute weights until the tie is broken.

19. (New) The method of Claim 5, further comprising:  
accessing information identifying available products, the availability of such products,  
and the product attributes of such products; and  
based on the accessed information, excluding from the set of one or more candidate  
alternative products all potential alternative products for which no excess supply is available.

20. (New) The method of Claim 19, further comprising, in response to user  
selection of a candidate alternative product, causing the identifying the availability of the  
selected candidate alternative product to be updated.

21. (New) The method of Claim 5, wherein the desired attribute value for a  
selected product attribute comprises a maximum, minimum, or exact attribute value for the  
selected product attribute.

22. (New) The method of Claim 5, wherein:  
the user request further specifies one or more of a maximum attribute value and a  
minimum attribute value for each selected product attribute; and  
selecting the set of one or more candidate alternative products comprises excluding  
from the set of one or more candidate alternative products all potential alternative products  
having attribute values that do not satisfy one or more of the maximum attribute value and the  
minimum attribute value for a corresponding selected product attribute.

23. (New) The method of Claim 5, wherein the user request further specifies a  
desired level of similarity for each of one or more product characteristics, each product  
characteristic encompassing one or more selected product attributes.

24. (New) The method of Claim 23, wherein the specified desired level of  
similarity for a product characteristic acts as a constraint on the attribute values a potential  
alternate product may have to become a candidate alternative product.

25. (New) The method of Claim 5, further comprising determining maximum and minimum attribute values across all potential alternative products for each product attribute for which a desired attribute value is specified.

26. (New) The method of Claim 5, wherein each attribute similarity value  $ASV$  for a selected product attribute is calculated as follows:

if the attribute value  $x$  for the potential alternative product is less than the desired attribute value  $A_r$  for the requested product,

$$ASV = \frac{x^2 - A_{\min}^2}{A_r^2 - A_{\min}^2}$$

where  $A_{\min}$  is a minimum attribute value for the selected product attribute across all potential alternative products; and

if the attribute value  $x$  for the potential alternative product is greater than the desired attribute value  $A_r$  for the requested product,

$$ASV = \frac{x^2 - A_{\max}^2}{A_r^2 - A_{\max}^2}$$

where  $A_{\max}$  is a maximum attribute value for the selected product attribute across all potential alternative products.

27. (New) The method of Claim 5, wherein if a selected product attribute is a binary attribute, then the attribute similarity value for a potential alternative product is zero if the attribute value for the potential alternative product is not the same as the desired attribute value for the requested product and is one if the attribute value for the potential alternative product is the same as the desired attribute value for the requested product.

28. (New) The method of Claim 5, wherein:

the user request further specifies an attribute weight for each selected product attribute; and

selecting the set of one or more candidate alternative products comprises:

determining a weighted sum of the attribute similarity values for the selected product attributes for the potential alternative product according to the attribute weights for the selected product attributes; and

determining the product similarity value for the potential alternative product according to the weighted sum of the attribute similarity values.

29. (New) The method of Claim 5, wherein the product similarity value for a potential alternative product comprises a global index value for the potential alternative product with respect to the requested product.

30. (New) The method of Claim 5, wherein:  
the user request further specifies a threshold product similarity value; and  
selecting the set of one or more candidate alternative products comprises comparing the product similarity value for each candidate alternative product with the threshold product similarity value and excluding from the set of one or more candidate alternative products each candidate alternative product having a product similarity value that does not satisfy the threshold product similarity value.

31. (New) The method of Claim 5, further comprising limiting the ranked candidate alternative products to a user-specified number.

32. (New) The method of Claim 5, wherein:  
the user request further specifies an attribute weight for each selected product attribute; and

rank ordering the one or more candidate alternative products comprises:

if two candidate alternative products are tied in that they have the same product similarity values, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the highest attribute weight;

if the two candidate alternative products are still tied in that they have the same attribute similarity value for the selected product attribute having the highest attribute weight, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the second highest attribute weight;  
and



if necessary to break the tie, continuing with respect to one or more successive selected product attributes having lower attribute weights until the tie is broken.

33. (New) Software for offering to a user one or more alternative products similar to a requested product, the software embodied in computer-readable media and when executed operable to:

receive from the user a request for a preferred product having one or more product attributes, the user request specifying a desired attribute value for each of one or more selected product attributes;

select a set of one or more candidate alternative products having attributes consistent with the desired attribute values for the selected product attributes, for each potential alternative product in a set of potential alternative products the search procedure operable to:

for each selected product attribute, compare the desired attribute value with the attribute value for the potential alternative product to determine an attribute similarity value for the product attribute for the potential alternative product; and

determine a product similarity value for the potential alternative product according to the attribute similarity values;

the set of one or more candidate alternative products being selected according to the product similarity values for the potential alternative products;

rank order the one or more candidate alternative products according to their degree of similarity with the preferred product determined according to the product similarity values for the one or more candidate alternative products; and

present to the user the set of one or more candidate alternative products for selection of a candidate alternative product.

34. (New) The software of Claim 33, further operable to:

access information identifying available products, the availability of such products, and the product attributes of such products; and

based on the accessed information, exclude from the set of one or more candidate alternative products all potential alternative products for which no excess supply is available.

35. (New) The software of Claim 34, further operable to, in response to user selection of a candidate alternative product, cause the identifying the availability of the selected candidate alternative product to be updated.

36. (New) The software of Claim 33, wherein the desired attribute value for a selected product attribute comprises a maximum, minimum, or exact attribute value for the selected product attribute.

37. (New) The software of Claim 33, wherein:  
the user request further specifies one or more of a maximum attribute value and a minimum attribute value for each selected product attribute; and  
selecting the set of one or more candidate alternative products comprises excluding from the set of one or more candidate alternative products all potential alternative products having attribute values that do not satisfy one or more of the maximum attribute value and the minimum attribute value for a corresponding selected product attribute.

38. (New) The software of Claim 33, wherein the user request further specifies a desired level of similarity for each of one or more product characteristics, each product characteristic encompassing one or more selected product attributes.

39. (New) The software of Claim 38, wherein the specified desired level of similarity for a product characteristic acts as a constraint on the attribute values a potential alternate product may have to become a candidate alternative product.

40. (New) The software of Claim 33, further operable to determine maximum and minimum attribute values across all potential alternative products for each product attribute for which a desired attribute value is specified.

41. (New) The software of Claim 33, wherein each attribute similarity value  $ASV$  for a selected product attribute is calculated as follows:

if the attribute value  $x$  for the potential alternative product is less than the desired attribute value  $A_r$  for the requested product,

$$ASV = \frac{x^2 - A_{\min}^2}{A_r^2 - A_{\min}^2}$$

where  $A_{\min}$  is a minimum attribute value for the selected product attribute across all potential alternative products; and

if the attribute value  $x$  for the potential alternative product is greater than the desired attribute value  $A_r$  for the requested product,

$$ASV = \frac{x^2 - A_{\max}^2}{A_r^2 - A_{\max}^2}$$

where  $A_{\max}$  is a maximum attribute value for the selected product attribute across all potential alternative products.

42. (New) The software of Claim 33, wherein if a selected product attribute is a binary attribute, then the attribute similarity value for a potential alternative product is zero if the attribute value for the potential alternative product is not the same as the desired attribute value for the requested product and is one if the attribute value for the potential alternative product is the same as the desired attribute value for the requested product.

43. (New) The software of Claim 33, wherein:  
the user request further specifies an attribute weight for each selected product attribute; and

selecting the set of one or more candidate alternative products comprises:

determining a weighted sum of the attribute similarity values for the selected product attributes for the potential alternative product according to the attribute weights for the selected product attributes; and

determining the product similarity value for the potential alternative product according to the weighted sum of the attribute similarity values.

44. (New) The software of Claim 33, wherein the product similarity value for a potential alternative product comprises a global index value for the potential alternative product with respect to the requested product.

45. (New) The software of Claim 33, wherein:  
the user request further specifies a threshold product similarity value; and  
selecting the set of one or more candidate alternative products comprises comparing the product similarity value for each candidate alternative product with the threshold product similarity value and excluding from the set of one or more candidate alternative products each candidate alternative product having a product similarity value that does not satisfy the threshold product similarity value.

46. (New) The software of Claim 33, further operable to limit the ranked candidate alternative products to a user-specified number.

47. (New) The software of Claim 33, wherein:  
the user request further specifies an attribute weight for each selected product attribute; and

rank ordering the one or more candidate alternative products comprises:

if two candidate alternative products are tied in that they have the same product similarity values, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the highest attribute weight;

if the two candidate alternative products are still tied in that they have the same attribute similarity value for the selected product attribute having the highest attribute weight, ranking the two candidate alternative products in order of decreasing attribute similarity value for the selected product attribute having the second highest attribute weight; and

if necessary to break the tie, continuing with respect to one or more successive selected product attributes having lower attribute weights until the tie is broken.

48. (New) A system for offering to a user one or more alternative products similar to a requested product, comprising:

a user interface operable to receive a user request for a product having one or more product attributes, the user request specifying:

a desired attribute value each of one or more selected product attributes;

an attribute weight for each selected product attribute; and  
a threshold product similarity value;

a search procedure operable to select a set of one or more candidate alternative products having attribute values consistent with the desired attribute values for the selected product attributes, for each potential alternative product in a set of potential alternative products the search procedure operable to:

for each selected product attribute, compare the desired attribute value with the attribute value for the potential alternative product to determine an attribute similarity index value for the product attribute for the potential alternative product;

determine a weighted sum of the attribute similarity index values for the selected product attributes for the potential alternative product according to the attribute weights for the selected product attributes; and

determine a product similarity index value for the potential alternative product according to the weighted sum of the attribute similarity index values;

compare the product similarity value for the potential alternative product with the threshold product similarity value and to include the potential alternative product in the set of one or more candidate alternative products if the potential alternative product has a product similarity value that satisfies the threshold product similarity value;

a sort procedure operable to rank the one or more candidate alternative products in order of decreasing similarity to the requested product determined according to the product similarity index values for the one or more candidate alternative products; and

the user interface operable to present the set of one or more candidate alternative products to the user for selection of a candidate alternative product.